

## NEW LEARNERS' SATISFACTION WITH ONLINE EDUCATION: A LONGITUDINAL STUDY

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### ABSTRACT

With recent advancements in IT, internet systems and and the need for IT-driven society, particularly during Covid-19, online education (online learning, or e-learning) has become inevitable to achieve the multiple objectives (such as cost-effective, time- efficient, quality enhancement, etc.) both for educator and learner. Keeping in view the importance of online education, the current study focuses on pedagogy of how to increase the efficiency of a learner. Therefore, this study is aiming to explore how these two dimensions of online learning style are used to measure new learners' satisfaction with online education, for which this study focuses on identifying the role of a student-teacher-contact (STC) in exploring the degree of learners' satisfaction with online education, and also applying the moderating effect of student-student contact (SSC). A total of 340 target respondents were surveyed in three phases. The results showed that STC interaction was insignificant during phase – I, whereas both interactions were found significant during phase – II & III. The research emphasizes that SSC in the presence of moderators has a significant determinant of the degree of new learners' satisfaction with online education. In addition, the management of online learning institutions will realize that SSC is essential for achieving new learners' satisfaction with online education. Since there is no sufficient literature on the moderating role of STC, this study is a valuable contribution to the existing body of knowledge.

**Keywords:** Student-to-teacher contact, student-to-student contact, new online learners, satisfaction with online education, COVID-19, UAE educational institutions.

### INTRODUCTION

Many research studies have been conducted to determine whether face-to-face or traditional teaching methods are more effective, or if online or hybrid learning is superior (Lockman & Schirmer, 2020; Pei & Wu, 2019). Students perform far better in online learning than in traditional, according to the findings of the studies. Henriksen et al. (2020) discussed the difficulties instructors experience while transitioning from an offline to an online style of instruction. . Therefore, the current study is investigating the core issue related

to contacts (student-teacher contact and student-student contact) to enhance the satisfaction and efficiency of learning in online education. Online education is a necessity for working-class people as a tool for time-effective and is for full-time students during the COVID-19 epidemic period.

COVID-19 has caused the suspension of courses for millions of children around the world, disrupting schools' initial teaching plans in these countries (Chen et al., 2020). Yet, advances in network information technology have hastened the digitization of traditional education, facilitated the deep integration of topics, courses, and information technology, and facilitated the experience and discovery of online learning (Paudel, 2021). Many countries started providing students with online instruction through systems like Zoom, Skype, and FaceTime. COVID-19 affects online education, which has become a prevalent mode of learning for both working-class and full-time students. Online education is predicted to be a long-term solution given the current state of global epidemic prevention and control. Online education is projected to be a long-standing teaching approach based on the existing worldwide epidemic prevention and control situation (Moore et al., 2010; Chen et al., 2020). Since, it had been a critical issue for the only working class to have access to higher education (King, 2009) because they are required to have at least some form of postsecondary or higher education degree to meet market demand. But, during this COVID-19 epidemic period, the world has witnessed the importance of online education since it has been becoming an alternative mechanism for higher education (March-June 2020). Though there is an increase in the numbers of learners who are willing to enroll, they are exposed to number of obstacles in accessing online education like lack of devices, from learners' end, less information, fever internet facilities/connectivity, and lack of coordination among new learners (Aboagye et al., 2021; Chase et al., 2018; Parsad & Lewis, 2008; Chang, 2007). This sudden transformation from direct contact to online learning requires the educational system to formulate strategies to meet the challenges (such as lack of classroom culture, student-student interaction, and internet connectivity). It is very important to explore the perception of the quality of online learning as it serves as one of the key drivers for learners' choice of online education (Braun, 2008). The other factors that affect perceptions and level of satisfaction are student-to-teacher contact, student-to-student contact, and their online experiences as suggested by earlier researchers (Cleofas & Rocha, 2021; LaBarbera, 2013; Shipley, Johnson, & Hashemi, 2009; Sahin, 2008). The literature highlights online experience, characterized by the three interactions of Moore's Transactional Theory, as positive determinants of satisfaction (Falloon, 2011; Arbaugh et al., 2008). Precisely, the problem is to determine to what extent a blend of experience (like student-to-teacher contact, and student-to-student contact) is most significant in envisaging satisfaction and quality of online education for these new learners. The understanding would help educational institutions to advance pedagogy, and help them in designing courses, and the adopting of technological devices (Cleofas & Rocha, 2021; LaBarbera, 2013). The current study quantitatively investigates the predictor of the learners' level of satisfaction in three two dimensions (Student-Teacher Contact and student-student Contact) on online education and provides timely solutions to the stakeholders in aligning their education system as per demand; this will also help to address the concerns to achieve the desired objectives.

## **THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT**

The current study mainly addresses different concerns at a time. Firstly, while online education has become the only mechanism of providing education during COVID-19 and is accepted in higher education for the public and private institutions; it has been observed that the attrition rate in online education is comparatively higher than that of traditional scholiast (Angelino, Williams, & Natvig, 2007). Prior researchers highlight learners' level of satisfaction as one of the key factors influencing the decision to persist or drop out of online education (Park & Choi, 2009; Aragon & Johnson, 2008). Moore (1989) argued that there are three sorts of interactions in online learning, that is, learners and learning content, learners and teachers, and learners and learners. Based on this, Li et al. (2020) defined "Internet + teaching" as "information contact between teachers and students, as well as instructional aspects" in a specific context, indicating the shift from one-way to multi-directional interaction. They also mentioned how good the amount of interaction is. The quality of classroom questions reflects this level. According to studies, the proportion of high-level questions that can improve classroom learning impacts has increased dramatically (Graesser and Olde, 2003). There are number of factors, such as knowledge acquisition, ability training, emotional edification, and value establishment, organization learning culture, which constitute an interactive system (e.g., student-to-teacher contact and

student-to-student contact), that influence learners' perceptions of satisfaction with online education (Mu and Wang, 2019; Jiang et al., 2019). However, researchers find inconclusive a mix of findings relating to determinants of perception of learner's satisfaction (Li et al., 2020; Mu and Wang, 2019; Jiang et al., 2019). To address the concern of inconclusiveness of the factors affecting learners' satisfaction about online or traditional education, the study aims to investigate to what extent the grouping of predictor variables predicts the perceptions of satisfaction among new learners of online education in the UAE context. The findings of the current longitudinal study enable us to contribute to the new challenging field of study in designing online courses, methods of delivery, and pedagogy. Since the quality of online education has been the main cause of concern for both stakeholders (online institutions and learners). Okpala and Chapman (2010) highlighted the key factors that contribute to the perception of the quality of online education that would help institutions to re-design online pedagogy accordingly. At the same time, it would also be beneficial for the Higher Education System (Ministry of Higher Education-MoHE) in UAE to formulate the policy or review the existing policy that may address the concerns highlighted by the current study.

Secondly, the current study only focuses on students who have recently shifted from traditional learning systems to online education following the study of Richardson et al., (2020) whose findings enable management to decide to adopt online or hybrid teaching approaches. The findings may help to fill in the gap in a study relating to the education set-ups who have just started online education. At the same time, it may also help MoHE for making a new policy if COVID-19 becomes prolonged. The introduction of advanced technology and the desire to acquire information instantaneously make the learning process quite different from the traditionally accepted and established one (Eubank, 2011). In emerging countries, online education has been introduced as a new form of distance learning with its unique learning features like synchronous, asynchronous, or/and hybrid (blended). Since, online pedagogy is different from traditional one as it is mainly required to facilitate teaching and learning in the cyber classroom (Maeroff, 2003). Isolation, being one of the key features of online education, has been found as a negative predictor of perceptions of online satisfaction (LaBarbera, 2013; Darrington, 2008; Angelino, Natvig, & Williams, 2007). Further, the literature documents certain learning styles as positive predictors of satisfaction with online education (Battalio, 2009; Sahin, 2008). To investigate the impacts of different learning styles on the level of satisfaction, the current study follows the theoretical frameworks of Moore's Theory of Transactional Distance (hereafter TDT) and Felder-Soloman's Index of Learning Styles (Moore, 1997; Felder & Soloman, 1991). Originally, TDT explains the interactions between/among the environment, the learners and teacher, and forms of behavior (Moore, 1997). The TDT also emphasizes the parting in distance between students (learners) and instructors; this separation results in a distinct pattern in learners' behavior (Moore, 1997). In this vein, Sahin, (2008) documents three types of interaction namely learners-to-teacher, learners-to-learners, and learners' content. However, the current study mainly focuses on the first two aspects of the three approaches described by Sahin, (2008). Akyol and Ozden, (2009) state that online experience is based on the two types of interactions, which significantly influence learners' perceptions of satisfaction with online systems (Akyol and Ozden, 2009). In the context of designing the course, the TDT classifies three extents that form an association and therefore may be graded from high to low. For example, institutions can design a course structure with either more flexible activities or rigid ones. In brief, a flexible approach is related to a high conversation between learners and teachers (Sahin, 2008). Similarly, Martin, Budhrani, Kumar & Ritzhaupt, (2019) conduct an interview form award-winning online instructors and they find online instructors' roles as facilitator, course designer, course manager, subject expert, and mentor. The current study examines the online instructor role of being a facilitator following Pappas, (2014). According to Martin and Ritzhaupt, (2019), "online facilitation is the technique of enabling and promoting learning in an online environment using encouraging interaction with and between students and supporting interactive online learning activities". Similarly, online facilitators are required to learn strategies that improve the online course and find or invent new ways to involve the learners in concept meaning (Gustafson and Gibbs, 2000). Further, the study also follows the learning styles model developed by Felder and Soloman (1991). The literature documents these leanings styles as positive predictors of the perception of online satisfaction (Shipley and Hashemi, 2009). Based on the theoretical background discussed, the study constructs the following research questions to address the concerns in UAE context. Once, the research questions are presented, the study documents the main hypotheses to answer the questions.

RQ1: To what degree does the combination of experience with student-teacher contact, and student-student contact predict the degree of satisfaction with online education for learners in UAE universities?

RQ2: To what degree does the interaction of student-student contact moderates the relationship between student-to-teacher contact and new learners' satisfaction with online education for learners in UAE universities?

Effective teacher-student engagement is an essential requirement for deep learning in the context of online education (Mu and Wang, 2019); it is the most powerful factor in the online learning experience (Jiang et al., 2019), and people lead to effective interaction between teachers and students. The impact of various interactive tactics in distant education is dependent on professors and students working together (Liu, 2006). As a result, Hypothesis 1 is proposed in this study:

When examining lecture delivery, Zhang et al. (2020) discovered that a favorable classroom climate is essential in boosting the teaching effect. Students' subjective environmental cognition is influenced by the classroom ambiance, and student's perceptions of the learning environment have a significant impact on their academic achievement (Yu et al., 2013). This study, when combined with the results of the previous research, suggests that a positive psychological environment can help students who are not directly supervised and thus can receive online education more actively in interactions with teachers, allowing them to speed up the learning process in the classroom, which helps to achieve the high impact of learning. Hypotheses 2 and 3 are thus proposed as well:

## Hypotheses

- H<sub>1</sub>. The combination of experience with learners-teacher contact does predict the degree of satisfaction with online education for learners in UAE universities.
- H<sub>2</sub>. The combination of experience with learners-learners contact does predict the degree of satisfaction with online education for learners in UAE universities.
- H<sub>3</sub>. The learners-learners experience does positively moderate the relationship between learners-teacher and the degree of satisfaction with online education for learners in UAE universities.

## RESEARCH METHODS

The present study is qualitative in nature which was designed to examine the direct effect of student-teacher-contact (STC) on satisfaction with online education. Moreover, this study is also designed to find the interaction of student-student contact (SSC) on the relation between STC and new learners' satisfaction with online education among new learners who have sifted from conventional education systems to online education during COVID-19.

## Participants

The population for the study was new learners who have been shifted from traditional learning to online education due to COVID-19 who reside in the United Arab Emirates and the participants are new learners enrolled at four universities – City University College Ajman, Skyline University College Ajman, Amity University Dubai, and Al Ghurair University Dubai as a convenient purposive sampling.

## Data Collection and Analysis

The instrument for data collection was a survey consisting of the Distance Education Learning Environment Survey (DELES) adapted from Walker (2005) for perception, and the Index of Learning Styles (ILS), as developed by Felder and Soloman (1991). The scale was changed from 5-points Likert Scale to 7-points Likert Scale to provide more options for new learners to respond more conveniently (See appendix-A

questionnaire). A purposive sample of students (university graduates from UAE universities) currently shifted to online education due to COVID-19 was asked to participate in the study.

Based on a G\*Power Analysis (with effect size 0.50, confidence level 0.90, probability of error 0.05, two-tailed), the sample size was 178, but the actual sample size collected was 340 in three phases – after two-week 88 respondents, after four-week 120 respondents, and after six-week 132 respondents. The survey was delivered using an electronic invitation for participation to be sent out to new learners through the contacts at the institutions. The independent variables in this study include the learning experience-learners-to-teachers, and a moderator learning experience which includes learners-to-learners are derived from DELES. The dependent variables were the learners' satisfaction with their perceived quality of online education, which are the scores derived from DELES. Quantitative analyses consisted of descriptive statistics for perceptions, and multiple linear regressions for predicting relationships.

## DATA ANALYSIS

### Confirmatory Factor Analysis and Reliability

In this study, the standardized factor loadings, factor correlations, and parameter estimates were examined. The current study's factor loadings were found to range between 0.23 to 0.48 in phase-I, 0.51 to 0.66 in Phase II, and 0.72 to 0.86 in Phase-III; and phase II and III are above the minimum acceptable level. Kline's (2011) criterion to accept the standardized factor loadings was set at >0.50. Kline (2011) suggested that in applied factor analytic research, the standardized factor loadings of 0.50 and above can be commonly used to operationally define a salient factor loading. The reliability (Cronbach's alpha) and composite reliability were found to be above the acceptable level because Nunally (1978) and Cascio (1987) reported that the acceptable level was > 0.70. Similarly, Kaiser-Meyer-Olkin's (KMO) measure of sampling adequacy tests was found at > 0.85, which reflects that phase-II and III the number of respondents (N#120, 132) was enough for further analysis.

**Table 1.** Confirmatory factor analysis and reliability

Constructs	Phase-I			Phase-II			Phase-III		
	FL	$\alpha$	KMO test	FL	$\alpha$	KMO test	FL	$\alpha$	KMO test
STC	0.23			0.63			0.86		
SSC	0.48	0.48	0.61	0.51	0.78	0.75	0.72	0.87	0.89
SS	0.33			0.66			0.75		

*Note: STC = Student-to-teacher contact, SSC = Student-to-student contact, SS = Student satisfaction with online education, FL = Factor loading,  $\alpha$  = reliability Cronbach's alpha*

## CORRELATION ANALYSIS

After analyzing the constructs, the researcher calculated the descriptive statistics including the mean, and correlations between all the study variables, which are presented in table 2. The mean response of the 7 Likert scales of STC was found almost the same throughout the three phases (5.248, 5.432, 5.444), whereas the mean response of SSC was very low during phase-I (2.283) and it was substantially increased in phase II and III (5.393, 6.320). More importantly, the mean response of SS was increased over phase II and III (4.775, 5.537) along with SSC, which indicates a strong significant correlation between SSC and SS. The correlation coefficients between the study variables were in the expected direction and below .80, which revealed the absence of multicollinearity and can contribute unique variance to the model (Tabachnick & Fidell, 2001). These findings support the multiple regression analysis.

**Table 2.** Mean, standard deviation, and correlations

Construct	Phase-I			Phase-II				Phase-III				
	Mean	STC	SSC	SS	Mean	STC	SSC	SS	Mean	STC	SSC	SS
STC	5.248	1			5.432	1			5.444	1		
SSC	2.283	0.003	1		5.393	0.217**	1		6.320	0.547***	1	
SS	3.418	0.025**	0.018	1	4.775	0.102**	0.275**	1	5.537	0.327**	0.658***	1

Note: STC = Student-to-teacher contact, SSC = Student-to-student contact, SS = Student satisfaction with online education, the superscripts \*, \*\*, and \*\*\* indicate significance at the 90%, 95%, and 99% confidence levels, respectively

## HYPOTHESES TESTING ON OUTCOME VARIABLE (NEW LEARNERS' SATISFACTION)

Study findings in table 3 show that the STC predicts the new learners' satisfaction level in online education during phase-II and III of this study (standardized  $\beta = 0.181$  and  $0.122$ ,  $p < 0.05$ ). These results are significant and positive which supports  $H_1$  of this study. Concerning hypothesis 2 of the study, findings indicate that SSC is predicting the level of new learners' satisfaction with online education during phase-II and III (standardized  $\beta = 0.111$  and  $0.120$ ,  $p < 0.10$ ) but these results are significant at  $p = 10\%$  which indicate a low degree of significance. These findings support  $H_2$  of the current study.

The results (table 4) of the multiple regression analysis using the interaction effect have shown that the last two of three phases – phase-I & II are statistically significant at a confidence level of 99% ( $p < 0.01$ ), which explains 45.2% (phase-I) and 78.8% of the variation in the new learners' degree of satisfaction with online education. Furthermore, control variables have not been used because all respondents are an undergrad university students from the department of business and engineering with nearly equal age, experience, gender, etc.; and the correlation among categorical variables with study variables was found to be insignificant during three phases of analysis.

In addition, direct and interaction effects both were found to be insignificant during phase-I but when SSC was added as a moderator to phase-II, the  $R^2$  increased by 44.5%. The  $R^2$  is significant on the 1% level, which means that the impact of interaction variables (STC\*SSC) is highly significant, and SSC adds the explanation power significantly to the model. Similarly, during phase II the interaction variable further increased the coefficient (standardized  $\beta = 0.408$ ,  $p < 0.01$ ) with an  $R^2$  change of 33.5% positively which means that SSC is a major factor influencing new learners' satisfaction with online education. Furthermore, in phase-II and III, the F-value significantly increased from 8,531 to 218.43, which reflects that during UAE's transitional online education only SSC has an influential impact on the new learners' degree of satisfaction. Hence,  $H_3$  is strongly supported..

**Table 3.** Results of multiple regression analysis on learners' satisfaction in online education

Construct	Phase-I		Phase-II		Phase-III	
Intercept	0.231	0.247	0.419*	0.505**	0.633**	0.463**
STC	0.051	0.022	0.181**	0.143**	0.122**	0.150**
SSC	0.004	0.006	0.111*	0.125	0.120*	0.119
STC*SSC	-	0.038	-	0.383***	-	0.408***
$R^2$	0.004	0.007	0.230	0.452	0.241	0.788
$R^2$ adj.	0.002	0.004	0.204	0.388	0.225	0.652
F-value	0.215	8.153	12.337	114.549	12.460	218.43
$R^2$ change	NA	NA	0.226	0.445	0.011	0.336
Number of respondents	88		120		132	

Note: STC = Student-to-teacher contact, SSC = Student-to-student contact, SS = Student satisfaction with online education, the superscripts \*, \*\*, and \*\*\* indicate significance at the 90%, 95%, and 99% confidence levels, respectively. Phase-I = After two-week, Phase-II = After four-week, Phase-III = After six-week

## DISCUSSION

The study aims to investigate to what degree the combination of an interaction term and the predictor variables are significant in envisaging the learners' satisfaction with online education while shifting from traditional classroom teaching to online education (Lockman & Schirmer, 2020; Pei & Wu, 2019). Sahin, (2008) highlighted three types of transaction/interaction: student-to-teacher contact (STC), student-to-student contact (SSC), and student content (SC). As the literature has suggested that STC and SSC are significant predictors of learners' perception of satisfaction with online education (Sun et al., 2022; LaBarbera, 2013; Akyol & Garrison, 2008; Arbaugh, et al., 2008; Sahin, 2007), and therefore, the current study only focuses on these two significant predictors in UAE context. In a theoretical context, the study is based on the theoretical frameworks of Moore's Transactional Distance Theory (1997) (TDT) and the Felder-Soloman learning styles model (1991). TDT emphasizes the separation in distance between learners and teachers; this separation results in a distinct form in learners' behavior (Moore, 1997; Cleofas & Rocha, 2021).

The study mainly answers two research questions. Research question one inquired to what degree the combination of experience with student-teacher contacts, and student-student contact predict the degree of satisfaction with online education for university learners in UAE. For analytical purposes, we use the regression model and findings indicate that the combination of predictors significantly predicts learners' perception of satisfaction with online education during phase-II & III. In addition, we also find that the degree of the prediction with online education has a marginal impact (value of adjusted  $R^2$  is quite low) on prediction at a 90% confidence level. Study results are in line with earlier findings (Li et al., 2020; Mu and Wang, 2019; Jiang et al., 2019; Akyol and Garrison, 2008; Arbaugh et al., 2008, Chen et al., 2010). Similarly, there are two types of interactions that form the online experience, which significantly impacts learners' perceptions of satisfaction with online education (Akyol and Ozden, 2009). Resultantly, this study's findings contradict Bigg, (2006) verdicts on the implication of active learning and student-autonomy subscales. However, researchers' main findings support the earlier empirical studies.

Research question two inquired to what degree the interaction of student-student contacts moderates the relationship between student-to-teacher contact and new learners' satisfaction with online education for university learners in UAE. Results of the statistical analysis of the regression model indicated that the interaction does predict the new learners' satisfaction with online education significantly. Furthermore, the interaction of SSC has a substantially greater effect in predicting the new learners' satisfaction with online education. This study's findings are rather indirectly consistent with prior research on the perceived quality of online education (Okpala, Hopson, Fort, & Chapman, 2010; Chin et al., 2010; Braun, 2008; Shea & Bidjerano, 2008). Moreover, the findings also exemplified that a combination of both predictors and interaction has the highest influence in envisaging learners' perceived quality of online education in UAE. The findings indicated that the perception of new learners' satisfaction with online education was strongly influenced by the student-to-teacher, followed by the student-student combination, and much more importantly by the student-to-student interaction as a moderator (Carter and Rukholm, 2008). This shows that student-to-student interaction is necessary for learners' satisfaction with online education; but in practice, it is lacking seriously (Jiang et al., 2019; Carter and Rukholm, 2008). As a result, the study contributes to the prior knowledge of what extent the factors impact the learners' perception of satisfaction with online education. In addition, the study adds to the limited literature on the understanding of which features are significant in the insight of satisfaction with online education for the UAE university learners. The study also guides courses as well as system designers and online instructors to take into consideration and include the interaction (STC\*SSC) as an essential construct into an online system and undertakings to advance learners' perception of satisfaction with online education in UAE.

## RECOMMENDATIONS AND LIMITATIONS

The study provides evidence relating to degree the perceptions of satisfaction with online education are predicted by the learning styles -STC contact and STS contact or by a grouping of the predictors with a moderator. Importantly, the authors find evidence in line with earlier studies. Based on study findings, the

authors strongly recommend that online course designers and instructors need incorporate course activities that encourage improved/add interaction (STC\*SSC) irrespective of the methods of delivery. Additionally, this study also recommend online instructor training to ease of communication between instructors and learners and more importantly among learners; in combination, greatly expected improved perceptions of the quality of online education.

Further, future researchers can extend the findings to a larger population from UAE different universities. This would help to generalize the study findings in a better way. This study also recommends expanding the current study into a mixed-methods study (a combination of both quantitative and qualitative methods).

Despite several theoretical and practical implications, our study is not free from limitations. First, we investigated only two predictors of learners' level of satisfaction with online education. It is worthy to note that these two predictors are not the sole factors that contribute to learners' level of satisfaction. Future studies should use the multi factors and comparative study of different levels of education with data collected from various sectors (private and public) of UAE to increase the generalizability of the study.

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## APPENDIX-1

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### **Student-to-Instructor Contact (SIC)**

- 1 | If I have an inquiry, the instructor finds time to respond.
- 2 | The instructor helps me identify problem area in my study.
- 3 | The instructor responds promptly to my questions.
- 4 | The instructor gives me valuable feedback on my assignments.
- 5 | The instructor adequately addresses my questions.
- 6 | The instructor encourages my participation.
- 7 | It is easy to contact the instructor.
- 8 | The instructor provides me both positive and negative feedback on my work.

### **Student-to-Student Contact (SSC)**

- 1 | I work with others.
- 2 | I relate my work to other's work.
- 3 | I share information with other students.
- 4 | I discuss my ideas with other students.
- 5 | I collaborate with other students in the class.
- 6 | Group work is a part of my activities.

### **Students' satisfaction with distance education**

- 1 | Distance education is stimulating me
  - 2 | I prefer distance education.
  - 3 | Distance education is exciting.
  - 4 | Distance education is worth my time
  - 5 | I enjoy studying by distance.
  - 6 | I look forward to learning by distance.
  - 7 | I would enjoy my education more if all my classes were by distance.
  - 8 | I am satisfied with this class.
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